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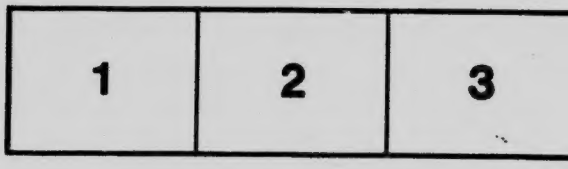

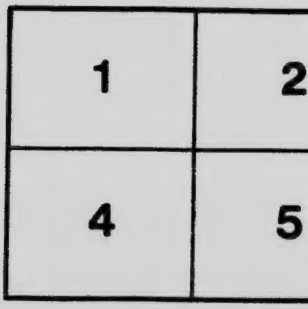

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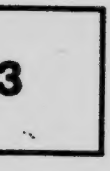

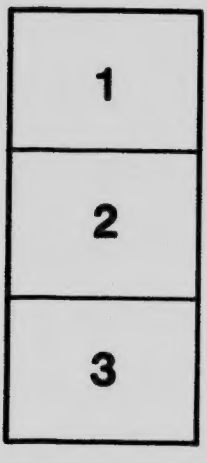

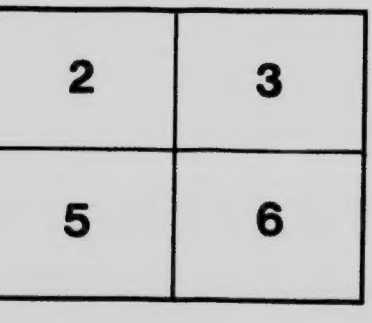

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DOMINION OF CANADA
Department of Agriculture
Experimental Farms
J. H. GRISDALE, B. Agr., *Director*
DIVISION OF BOTANY
FARMERS' CIRCULAR No. 4

EXPERIMENTAL FARMS
MAR 1 1923

POTATO DISEASES

TRANSMITTED BY THE USE OF

UNSOUND SEED POTATOES

BY

H. T. GÜSSOW
DOMINION BOTANIST

WITH

12 COLOURED FIGURES
Drawn by A. E. KELLETT

Stem end.

Eye End.

THE IDEAL SEED POTATO.

Central Experimental Farm, Ottawa
April, 1914

Published by the Direction of the HON. MARTIN BURRELL,
MINISTER OF AGRICULTURE, OTTAWA.

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Exp. Farms
Service
Circ.

POTATO DISEASES

Transmitted by the use of unsound Seed Potatoes.

The ideal "seed" potato is a potato free from any blemish; perfectly sound externally and internally.

Potatoes of this description produce the best yield, largest in quantity, best in quality, provided they are planted on suitable land that has not previously produced a diseased crop of potatoes.

Poor, unsound seed potatoes will give a poor yield, small in quantity and of inferior quality. They do not, if they sell at all, bring the highest market price.

There are two potato diseases which will infest the land and will render it unfit for raising potatoes for an indefinite number of years. The first is POTATO CANKER (see fig. 5), not at present found in Canada, but against which great vigilance is necessary. The second is POWDERY SCAB (see figs. 4 and 4a), a disease recently discovered on the Continent of America.

Under the Destructive Insect and Pest Act of Canada, any person using for seed potatoes infected by Potato Canker or POWDERY SCAB is liable to prosecution.

Never relax attention in looking for these two diseases; any case of Potato Canker —should such be found anywhere—or Powdery Scab, which already occurs in some parts of the Dominion, must be reported immediately to the Dominion Botanist, Experimental Farm, Ottawa. Potato growers are requested to send specimens if they suspect the presence of either disease. **The subsequent discovery of unreported cases of these diseases by any official of the Department, will lead to legal proceedings against the person having failed to report them.**

These diseases are to be reported to the Dominion Botanist in order that steps may be taken to prevent their establishment or spread. Concealment of Potato Canker and its subsequent discovery in potatoes exported would further bar Canadian potatoes from export. Negligent growers may thus inflict a serious hardship upon the potato growers of the whole Dominion. **Potato Canker is not known to exist in the Dominion at the present moment.** Powdery Scab is known in some localities. This disease must be wiped out. Farmers alone can do this by advising the Department of cases known to them, and by closely following the instructions which will be sent.

If in doubt as to the fitness of potatoes for use as seed, send a sample to the Dominion Botanist (post free if below 5 lb. in weight), who will advise you by return mail.

POTATO DISEASES TRANSMITTED BY THE USE OF UNSOUND POTATOES

The coloured chart shows a number of potatoes affected by fungus diseases, and blemishes which are not diseases, but which it is not advisable to use for seed.

Fig. 1 represents a potato externally apparently without a blemish, but which when cut in halves will show a hollow centre. This is commonly known as "Hollow Potato." It is not a disease, but due to internal rupture of tissues.

Fig. 2 shows a physiological trouble known as "Internal Brown Streak." It is not a disease, but more of a varietal or seasonal trouble. Potatoes so affected may appear quite sound externally.

Fig. 3 illustrates the "Rhizoctonia" or "Little Potato" disease, and fig. 8 represents a potato affected with "Common Scab." Both diseases are widely prevalent wherever potatoes are grown. In

ARTHUR E. KELLETT. 14.

some years it is difficult to secure seed potatoes free from either disease. Seed treatment is recommended for these two troubles. Soak the tubers for three hours in a 1: 2000 sol. of bichloride of mercury (corrosive sublimate) or in 1 lb. formalin in 30 Imperial gallons of water. The former chemical is highly poisonous and will corrode iron vessels—hence use wooden barrels or tubs—the latter is distinctly pungent and irritating to the skin, though not a serious poison.

None of the following Diseases can be Controlled by Seed Treatment

Figs. 4 and 4a represent the appearance of POWDERY SCAB. This disease is considered so serious by the United States authorities that they placed an embargo on all potatoes from countries where this disease existed. This included the Dominion of Canada. This disease resembles Common Scab (Fig. 8), but is in reality more serious, particularly when potatoes affected with Powdery Scab are planted year after year on the same land, when the disease may assume a serious nature and produce a crop hardly worth harvesting.

Where Cases of this Disease have occurred, Change Your Seed and Plant on New Land

It would be unwise to pick out apparently sound potatoes from a diseased crop, as the initial stages of the disease may not be visible externally. These are the only precautions which will rid the country at the earliest date possible of this disease. Every case of this disease must be reported to the Dominion Botanist. Farmers should bear in mind the consequences of not reporting cases of this disease.

Fig. 5. A tuber infected with POTATO CANKER. Another disease that must be reported immediately, should any case be found to occur in Canada. It is a serious potato disease. All importations of potatoes into Canada from Europe and other countries are prohibited because of the prevalence of this disease in those territories. This precaution had to be taken as a temporary measure, because if Potato Canker should be found to occur in Canada, this would be another reason for an embargo on Canadian potatoes. (See also Farmers' circular No. 3 entitled POTATO CANKER DANGER.)

Figs. 6 and 6a illustrate common "Dry Rot." This form of disease is most common among stored potatoes in bins, pits or cellars. Whitish fungus or mouldy growths appear on the outside of a shrunken, dry, hard skin. The inside consists of a dry, powdery, discoloured substance. Another "storage" rot is the "Wet Rot" in which the potato is reduced to a soft, decaying mass, giving off a putrid odour. Both diseases render tubers totally unfit for use as "seed."

Fig. 7. Some potatoes may appear quite sound externally (see also descriptions of figs. 1 and 2) but when cut at the "stem" end, a brownish-black ring or discoloured area just below the skin, may become noticed; this discolouration will disappear frequently on cutting away slices towards the "eye" end. This is a disease known as "Stem End Rot." In severe cases the discolouration area will be diffused through the whole interior of the potato. Potatoes showing this disease will frequently rot in the ground when planted. They are quite useless for seed purposes.

Fig. 8. Common Potato Scab (See under Fig. 2.)

Figs. 9 and 9a illustrate a disease very widely known in potato growing countries. They show potatoes affected with "Late Blight." Externally this disease is visible by the darker brown sunken-in portions of the skin. When cutting into these spots the "flesh" underneath will show irregular brownish spots permeating the interior. Such potatoes are unfit for seed purposes. It is probable that the destructive epidemics of Late Blight in the standing crop originate from the planting of such seed.

These are the commonest diseases of potatoes transmitted by the "seed tubers." **Note the importance of at once reporting any cases of Potato Canker or Powdery Scab. Prompt action only will avert serious damage. The sooner Powdery Scab is wiped out the better. This should be the aim of all Canadian potato growers.** This result can be brought about only by the use of sound seed potatoes planted on suitable soil that has not previously produced a diseased potato crop. **Re-appearance of powdery scab in potatoes is an indication that the grower has been neglectful in the choice of his seed potatoes or his land. The neglect of one may be a detriment to a whole community or a whole county.**

The Dominion Botanist, Central Experimental Farm, Ottawa, to whom letters and parcels under five pounds in weight may be addressed free of postage, will be very glad to assist farmers in all matters of diseased vegetation. It is important to communicate any trouble in time and not allow it to become serious before seeking advice, when it is often too late to be of service.

H. T. GÜSSOW,
Dominion Botanist.

April, 1914. 125,000 E 40,000 F.